5-7-2010

Temperature Fluctuations Have and May Continue to Inhibit Corn Emergence

Roger Elmore
Iowa State University

Lori Abendroth
Iowa State University, labend@iastate.edu

search

Subscribe to Crop News

Archives

2015
2014
2013
2012
2011
2010
2009
2008

Previous Years

ISU Crop Resources

Extension Field Agronomists
Crop & Soils Info
Pesticide Applicator Training
Agronomy Extension
Entomology Extension
Plant Pathology Extension
Ag and Biosystems Engineering Extension
Agribusiness Education Program
Iowa Grain Quality Initiative
College of Agriculture and Life Sciences
ISU Extension

Integrated Crop Management NEWS

Print story
Email story
Add to Delicious
Atom Feed
Follow on Twitter

Temperature Fluctuations Have and May Continue to Inhibit Corn Emergence

By Roger Elmore and Lori Abendroth, Department of Agronomy

Corn planting proceeded at an all-time record this spring. We've experienced one of the best planting seasons ever in Iowa. According to the most recent USDA-NASS report (2 May 2010), 84 percent of Iowa's corn was planted with cropping districts ranging from 69 percent complete in south central Iowa to 92 percent complete in north central Iowa. Overall, corn has been planted within the recommended window which should serve to maximize yield potential relative to planting date.

Soil and weather conditions at planting and emergence were excellent for most of the state. Alison Robertson recently emphasized the need to assess seedling health when doing stand counts in a May 4, 2010 ICM article in response to some of the problems occurring in southeast Iowa this spring. Seedling emergence problems there are correlated with swings in April soil temperature.

Cooler soil temperatures slow the germination process and predispose seedlings to fungal infection. We have also observed, or heard reports of, seedling growth problems in some parts of Iowa already this year, including:

- Imbibitional chilling damage, which is the chilling effect seeds may experience when they imbibe, or absorb, water when soil temperatures are less than 55 F for an extended time. Seedlings may "corkscrew" or not emerge when exposed to these cool soil temperatures. This may happen also when there are rapid swings in air temperatures of nearly 30 F.
- Soil crusting due to wet soils at planting or heavy rains after planting reducing plant stands. Significant stand reductions lower yield potential.
- "Leafing out" underground - see Photo 1.This occurs most often in crusted soils and also appears associated with imbibitional chilling, mentioned above.
- Variable plant emergence and reduced plant population - see Photo 2. Variable emergence and growth will reduce yield.

Cool Temperatures Soon?

The forecast for the next several days is for air temperatures dropping into the high 30's at night; soil temperatures will also lower respectively. Growers and agronomists should pay particular attention to corn fields planted recently as they are the most likely to exhibit seedling rot or poorer emergence associated with some of the issues mentioned here. Frost is likely to occur in low lying areas causing leaf necrosis and delayed growth of sprouted seeds.

Any of the situations mentioned above may result in a need to replant. Assess

stands well before making this decision.

Irrespective of all of these issues, 2010 has provided one of the best planting seasons to date. Most of Iowa's corn was planted within a timeframe that should serve to maximize yield potential.

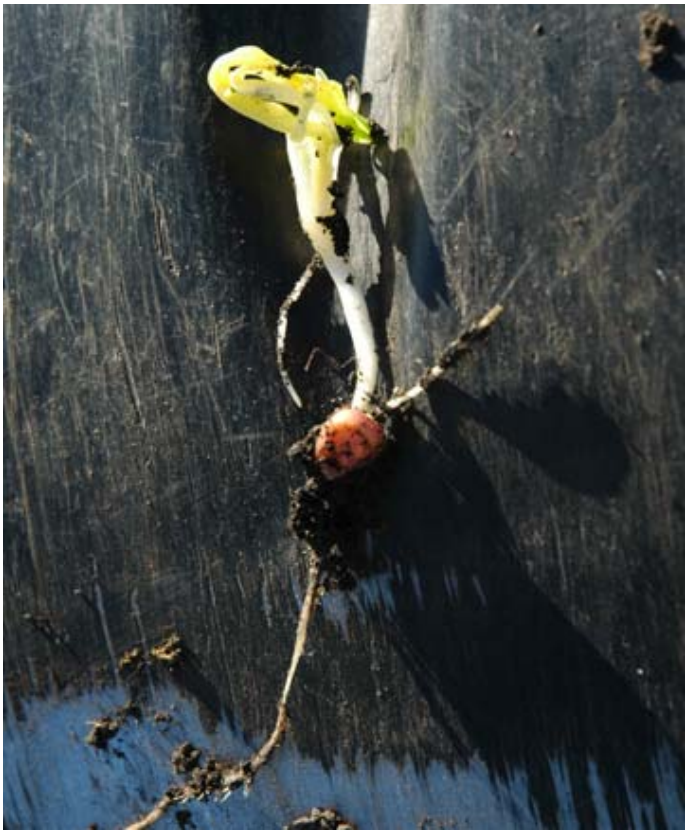

Photo 1. Seedling leaved out under soil surface. Story Co. IA, 4 May 2010. Roger Elmore.

Photo 2. Variable seedling emergence dates can reduce yields. Story Co. IA, 4 May 2010. Roger Elmore. See additional photos for leaving out underground and variable seedling emergence.

Roger Elmore is a professor of agronomy with research and extension responsibilities in corn production. Lori Abendroth is an agronomy specialist with research and extension responsibilities in corn production. Elmore can be contacted by email at relmore@iastate.edu or (515) 294-6655; Abendroth can be contacted by email at labend@iastate.edu or (515) 294-5692.
